

FORM PTO-1390 (REV. 12-2001)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NUMBER 34307
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371			U.S. APPLICATION NO. (if known, see 37 CFR 1.5) 10/031973
INTERNATIONAL APPLICATION NO. PCT/JP99/05410	INTERNATIONAL FILING DATE 01 October 1999	PRIORITY DATE CLAIMED 29 July 1999	
TITLE OF INVENTION ELECTRICALLY POWERED ROLLER MASSAGING IMPLEMENT			
APPLICANT(S) FOR DO/EO/US TAKAMURA, Shigeo			
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:			
<p>1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.</p> <p>2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.</p> <p>3. <input type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.</p> <p>4. <input checked="" type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (Article 31).</p> <p>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2))</p> <p>a. <input type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau).</p> <p>b. <input checked="" type="checkbox"/> has been communicated by the International Bureau.</p> <p>c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</p> <p>6. <input checked="" type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).</p> <p>a. <input checked="" type="checkbox"/> is attached hereto.</p> <p>b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4).</p> <p>7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))</p> <p>a. <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau).</p> <p>b. <input type="checkbox"/> have been communicated by the International Bureau.</p> <p>c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</p> <p>d. <input checked="" type="checkbox"/> have not been made and will not be made.</p> <p>8. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).</p> <p>9. <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).</p> <p>10. <input type="checkbox"/> An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</p> <p>Items 11 to 20 below concern document(s) or information included:</p> <p>11. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</p> <p>12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</p> <p>13. <input checked="" type="checkbox"/> A FIRST preliminary amendment.</p> <p>14. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment.</p> <p>15. <input type="checkbox"/> A substitute specification.</p> <p>16. <input type="checkbox"/> A change of power of attorney and/or address letter.</p> <p>17. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.</p>			

U.S. APPLICATION NO. 10/031973 INTERNATIONAL APPLICATION NO. PCT/JP99/05410		ATTORNEY'S DOCKET NUMBER 34307																					
21. <input checked="" type="checkbox"/> The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)): Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$1040.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$890.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$740.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$710.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00 ENTER APPROPRIATE BASIC FEE AMOUNT =		CALCULATIONS PTO USE ONLY <div style="border: 1px solid black; padding: 5px; margin: 5px;"> 890.00 </div>																					
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input checked="" type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).		\$	890.00																				
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">CLAIMS</th> <th style="width: 20%;">NUMBER FILED</th> <th style="width: 20%;">NUMBER EXTRA</th> <th style="width: 20%;">RATE</th> </tr> </thead> <tbody> <tr> <td>Total claims</td> <td>- 20 =</td> <td></td> <td>x \$18.00</td> </tr> <tr> <td>Independent claims</td> <td>- 3 =</td> <td></td> <td>x \$84.00</td> </tr> <tr> <td colspan="3">MULTIPLE DEPENDENT CLAIM(S) (if applicable)</td> <td>+ \$280.00</td> </tr> <tr> <td colspan="3" style="text-align: right;">TOTAL OF ABOVE CALCULATIONS =</td> <td>\$ 1,020.00</td> </tr> </tbody> </table>		CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	Total claims	- 20 =		x \$18.00	Independent claims	- 3 =		x \$84.00	MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$280.00	TOTAL OF ABOVE CALCULATIONS =			\$ 1,020.00	\$	
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Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +		\$																					
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a. <input checked="" type="checkbox"/> A check in the amount of \$ <u>510.00</u> to cover the above fees is enclosed. b. <input type="checkbox"/> Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed. c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. <u>16-0820</u> . A duplicate copy of this sheet is enclosed. d. <input type="checkbox"/> Fees are to be charged to a credit card. WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.																							
NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.494 or (b)) must be filed and granted to restore the application to pending status.																							

10/031973
531 Rec'd PCT/PT. 24 JAN 2002

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Shigeo Takamura
Title: ELECTRICALLY POWERED ROLLER MASSAGING
IMPLEMENT
Docket No.: 34307

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to the examination of the above-identified patent application, it is requested that the following amendments be made.

IN THE CLAIMS:

Please amend claims 4 - 7 to read as follows.

1 4. (amended) A unit-type roller drive device for
2 motor-driven roller massage actions according to claim 1,
3 wherein sensors to vary the turning direction of the
4 drive motor is provided on one side edge portion of the
5 frame in the vicinity of the upper and lower shafts.

1 5. (amended) A motor-driven roller massage
2 instrument, comprising:
3 a bucket-shaped base body having a concave portion
4 provided in the center of the base body for installation
5 of the roller drive device and left and right flexible

6 blade piece portions formed on the left and right sides
7 of said concave portion; and
8 belts mounted to the left and right blade piece
9 portions to fasten the user body and also to fasten the
10 other appliance;
11 wherein the roller drive device according to claim
12 1, is installed in said concave portion for installation
13 of the roller drive device.

1 6. (amended) A motor-driven roller massage
2 instrument, comprising:
3 an outside frame surrounding a bucket-shaped portion
4 on all sides; and
5 upper and lower lateral rods mounted across the left
6 and right frame portions of the outside frame and
7 respectively having concave portions;
8 wherein the roller drive device according to claim
9 1, is installed in said concave portions.

1 7. (amended) A legless chair mounted with a motor-
2 driven roller massage instrument, comprising:
3 a back portion rotatably mounted to a seat portion
4 and having an outside frame surrounding the back portion
5 on its upper, left and right sides;

6 upper and lower lateral rods mounted across the left
7 and right sides of the outside frame and respectively
8 having concave portions;
9 wherein the roller drive device according to claim
10 1, is installed in said concave portions.

Please add the following claims 8 - 18.

1 8. (new) A unit-type roller drive device for motor-
2 driven roller massage actions according to claim 2,
3 wherein sensors to vary the turning direction of the
4 drive motor is provided on one side edge portion of the
5 frame in the vicinity of the upper and lower shafts.

1 9. (new) A unit-type roller drive device for motor-
2 driven roller massage actions according to claim 3,
3 wherein sensors to vary the turning direction of the
4 drive motor is provided on one side edge portion of the
5 frame in the vicinity of the upper and lower shafts.

1 10. (new) A motor-driven roller massage instrument,
2 comprising:

3 a bucket-shaped base body having a concave portion
4 provided in the center of the base body for installation
5 of the roller drive device and left and right flexible
6 blade piece portions formed on the left and right sides
7 of said concave portion; and

8 belts mounted to the left and right blade piece
9 portions to fasten the user body and also to fasten the
10 other appliance;

11 wherein the roller drive device according to claim
12 2, is installed in said concave portion for installation
13 of the roller drive device.

1 11. (new) A motor-driven roller massage instrument,
2 comprising:

3 a bucket-shaped base body having a concave portion
4 provided in the center of the base body for installation
5 of the roller drive device and left and right flexible
6 blade piece portions formed on the left and right sides
7 of said concave portion; and

8 belts mounted to the left and right blade piece
9 portions to fasten the user body and also to fasten the
10 other appliance;

11 wherein the roller drive device according to claim
12 3, is installed in said concave portion for installation
13 of the roller drive device.

1 12. (new) A motor-driven roller massage instrument,
2 comprising:

3 a bucket-shaped base body having a concave portion
4 provided in the center of the base body for installation
5 of the roller drive device and left and right flexible

6 blade piece portions formed on the left and right sides
7 of said concave portion; and

8 belts mounted to the left and right blade piece
9 portions to fasten the user body and also to fasten the
10 other appliance;

11 wherein the roller drive device according to claim
12 4, is installed in said concave portion for installation
13 of the roller drive device.

1 13. (new) A motor-driven roller massage instrument,
2 comprising:
3 an outside frame surrounding a bucket-shaped portion
4 on all sides; and

5 upper and lower lateral rods mounted across the left
6 and right frame portions of the outside frame and
7 respectively having concave portions;

8 wherein the roller drive device according to claim
9 2, is installed in said concave portions.

1 14. (new) A motor-driven roller massage instrument,
2 comprising:

3 an outside frame surrounding a bucket-shaped portion
4 on all sides; and

5 upper and lower lateral rods mounted across the left
6 and right frame portions of the outside frame and
7 respectively having concave portions;

8 wherein the roller drive device according to claim
9 3, is installed in said concave portions.

1 15. (new) A motor-driven roller massage instrument,
2 comprising:

3 an outside frame surrounding a bucket-shaped portion
4 on all sides; and

5 upper and lower lateral rods mounted across the left
6 and right frame portions of the outside frame and
7 respectively having concave portions;

8 wherein the roller drive device according to claim
9 4, is installed in said concave portions.

1 16. (new) A legless chair mounted with a motor-
2 driven roller massage instrument, comprising:

3 a back portion rotatably mounted to a seat portion
4 and having an outside frame surrounding the back portion
5 on its upper, left and right sides;

6 upper and lower lateral rods mounted across the left
7 and right sides of the outside frame and respectively
8 having concave portions;

9 wherein the roller drive device according to claim
10 2, is installed in said concave portions.

1 17. (new) A legless chair mounted with a motor-
2 driven roller massage instrument, comprising:

3 a back portion rotatably mounted to a seat portion
4 and having an outside frame surrounding the back portion
5 on its upper, left and right sides;
6 upper and lower lateral rods mounted across the left
7 and right sides of the outside frame and respectively
8 having concave portions;
9 wherein the roller drive device according to claim
10 3, is installed in said concave portions.

1 18. (new) A legless chair mounted with a motor-
2 driven roller massage instrument, comprising:
3 a back portion rotatably mounted to a seat portion
4 and having an outside frame surrounding the back portion
5 on its upper, left and right sides;
6 upper and lower lateral rods mounted across the left
7 and right sides of the outside frame and respectively
8 having concave portions;
9 wherein the roller drive device according to claim
10 4, is installed in said concave portions.

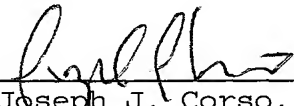
REMARKS

The foregoing amendments corrects multiple claim dependency for purposes of calculating the claim fee.

Attached hereto are pages entitled "Version With Markings to Show Changes Made".

If there are any further fees required by this amendment not covered by an enclosed check, or if no check is enclosed, please charge the same to Deposit Account No. 16-0820, Order No. 34307.

Respectfully submitted,

By: 
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Suite 1200
Cleveland, Ohio 44114-1484
(216) 579-1700

January 24, 2002

"VERSION WITH MARKINGS TO SHOW CHANGES MADE"IN THE CLAIMS:

Claims 4 - 7 have been amended in the following manner.

1 4. (amended) A unit-type roller drive device for
2 motor-driven roller massage actions according to claim 1,
3 [2 or 3,] wherein sensors to vary the turning direction
4 of the drive motor is provided on one side edge portion
5 of the frame in the vicinity of the upper and lower
6 shafts.

1 5. (amended) A motor-driven roller massage
2 instrument, comprising:
3 a bucket-shaped base body having a concave portion
4 provided in the center of the base body for installation
5 of the roller drive device and left and right flexible
6 blade piece portions formed on the left and right sides
7 of said concave portion; and

8 belts mounted to the left and right blade piece
9 portions to fasten the user body and also to fasten the
10 other appliance;

11 wherein the roller drive device according to claim
12 1, [2, 3 or 4] is installed in said concave portion for
13 installation of the roller drive device.

1 6. (amended) A motor-driven roller massage
2 instrument, comprising:
3 an outside frame surrounding a bucket-shaped portion
4 on all sides; and
5 upper and lower lateral rods mounted across the left
6 and right frame portions of the outside frame and
7 respectively having concave portions;
8 wherein the roller drive device according to claim
9 1, [2, 3 or 4] is installed in said concave portions.

1 7. (amended) A legless chair mounted with a motor-
2 driven roller massage instrument, comprising:
3 a back portion rotatably mounted to a seat portion
4 and having an outside frame surrounding the back portion
5 on its upper, left and right sides;
6 upper and lower lateral rods mounted across the left
7 and right sides of the outside frame and respectively
8 having concave portions;
9 wherein the roller drive device according to claim
10 1, [2, 3 or 4] is installed in said concave portions.

Claims 8 - 18 have been added and no marked-up
version is required.

11/PRTS

10/031973
1531 Rec'd PCT/F. 24 JAN 2002

SPECIFICATION

MOTOR-DRIVEN ROLLER MASSAGE INSTRUMENT

5 [Technical Field]

This invention relates to a unit-type roller drive device for motor-driven roller massage actions based on the actuation of guide slit-type roller chains for use in massaging the user back through the action of pressing against one's waist, back
10 and scruff of the neck, and also to a motor-driven roller massage instrument mounted with such a unit-type roller drive device.

[Background Art]

In the prior art, there is a motor-driven roller massage
15 instrument of a mat type having a size as long as the whole human body. A power transmission device portion of the above motor-driven roller massage instrument has left and right roller travel guide rails respectively incorporating stainless steel belts of a size as long as the whole human body. A single drive
20 source motor is installed on one end side of the guide rails, and a roller is mounted to the motor to mount a motor-driven roller travel belt to the roller axially. Then, a receiving box for taken-up belt and a single drive source motor are required for a set of a starting mechanism and a terminating mechanism of
25 the roller travel belt. Therefore, a double belt structure for forward and backward traveling is applied to the roller travel belt, which needs traveling from the starting mechanism to the terminating mechanism via a turn-back mechanism (due to the

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use of the single motor). For that reason, a structure of a so-called double structure power transmission device of the roller travel belt has been in use. That is, the repetitive forward and backward traveling is required for the roller travel belt, whenever this roller travel belt is received in an empty box for taken-up belt after traveling from the terminating mechanism to the starting mechanism via the turn-back mechanism in succession to the above traveling.

On the other hand, there is a device having a roller massage device incorporated only in the back portion. This device is of a type, in which a longitudinally spiral shaft is mounted to the back portion, and a massaging ball roller portion is mounted pivotally to the spiral shaft to rotate massaging ball rollers vertically in cooperation with the rotation of the spiral shaft.

However, the above motor-driven roller massage instrument in the prior art requires the stainless steel belt to ensure a certain degree of strength and elasticity, since it is necessary to mount the roller travel belt of a size as long as the whole human body. The accurate installation of guide rails or the like is also required to prevent the stainless steel belt from being twisted or crossed and so on in the course of traveling, together with a large number of auxiliary portions other than the guide rails. The receiving box for taken-up belt is further required due to the application of a belt take-up mode. For that reason, there is a need for complicated, large-volume, heavyweight mechanism, resulting in an increase of manufacture cost.

Further, a product in the prior art incorporating the drive device of a roller massage instrument into the back of a chair needs to have a thick seat portion and so on, since a large-sized motor is installed in the seat portion. For that reason, the
5 above product results in an increase in size and weight as a whole, and thus finds difficulty in movement.

In view of the above circumstances, a mechanically-simple, trouble-free, low-cost, versatile motor-driven roller massage instrument (See Japanese Patent Application Nos. 10-
10 193605 and 10-193609) was developed by the present applicants for application to keep the ideal figure with a stretch of the line of the backbone naturally.

An object of the present invention is to provide a more simple compact roller drive device for more certain smooth
15 driving of a motor-driven roller massage instrument than the previously applied invention, and also to provide a motor-driven roller massage instrument mounted with such a roller drive device.

20 [Disclosure of the Invention]

There is provided a roller drive device of a size as approximately high as the back of the human body. The roller drive device has a frame composed of a base portion and left and right edge portions standing upright from the left and right
25 edges of the base portion, and a longitudinal guide slit is provided in each of the left and right edge portions of the frame. A shaft having a gear is mounted to each of the upper and lower ends of the frame, and a roller chain is mounted in a ring shape

round the upper and lower shafts in meshing with the gears. A shaft bushing fixed to massaging ball rollers is mounted to each roller chain, and the left and right ends of the shaft bushings are mounted in the guide slits in an inserted state. With the
5 above structure, the roller chains are moved vertically by rotation of the shafts with a drive motor, and in cooperation with the vertical movement of the roller chains, the massaging ball rollers are guided in accordance with the guide slits for vertical movement. There are also provided a motor-driven
10 roller massager instrument and a legless chair respectively mounted with such a roller drive device.

[Brief Description of the Drawings]

Fig. 1 is a front view showing a roller massager device
15 according to the present invention;

Fig. 2 is a left side view showing the same;

Fig. 3 is a front central longitudinal cross-sectional view showing the same;

Fig. 4 is a fragmentary perspective view showing a
20 massaging roller mount portion;

Fig. 5 is a fragmentary sectional view showing the massaging roller mount portion;

Fig. 6 is a left side view showing another embodiment of a guide slit;

25 Fig. 7 is a front view showing a motor-driven roller massager instrument according to the present invention;

Fig. 8 is a front perspective view showing the motor-driven roller massager instrument;

Fig. 9 is a back perspective view showing the motor-driven roller massage instrument;

Fig. 10 is a perspective view showing a frame of a motor-driven roller massage instrument according to another embodiment; and

Fig. 11 is a perspective view showing a frame of a legless chair mounted with a motor-driven roller massage instrument.

[Best mode for Carrying out the Invention]

Hereinafter will be described the present invention on the basis of illustrated embodiments. Reference numeral 1 denotes a roller drive device according to the present invention. The roller drive device 1 has a size as approximately high as the back of the human body and is structured to move massaging ball rollers 3 mounted to roller chains 2 vertically in cooperation with the vertical movement of the roller chains 2.

A description of the roller drive device 1 will be given in more details. Reference numeral 4 denotes a frame, which houses the whole roller drive device 1. The frame 4 is formed in a channel-like plate shape by a lengthwise rectangular plate-shaped base portion 4a and left and right edge portions 4b, 4b standing upright from the left and right edges of the base portion along the longitudinal direction thereof. The left and right edge portions 4b, 4b are respectively provided with longitudinal (vertical) guide slits 4c. As shown in Fig. 2, each guide slit 4c is curved gently (as seen from the front) so as to make a dent in its intermediate portion, and is therefore adapted to a back curve natural for aged users as well.

Incidentally, it is to be understood that each guide slit 4c might be curved in a desired shape as one like the letter S, which makes it possible to keep the ideal figure, as shown in Fig. 6, for instance, without being limited to the above embodiment.

5 The massaging ball rollers 3 are guided in accordance with each guide slit 4c through a shaft bushing 5 for vertical movement. Each shaft bushing 5 has a rectangular plate-shaped base portion 5a and a triangular rising piece 5b extending from the inner edge of the surface of the base portion
10 5a, and two pieces of pins 6 are projecting from the back of the base portion 5a outwardly. Then, a rotatable guide roller 7 is mounted to the end of each of the two pieces of pins 6. The guide rollers 7 are mounted in an inserted state in each guide slit 4c, and the massaging ball rollers 3 are mounted in a
15 rotatable state to the top end of each rising piece 5b through a massaging ball roller mount piece 8.

The massaging ball roller mount piece 8 is formed in a shape like the letter V and is mounted in a pivotal state to each rising piece 5b. The massaging ball roller mount piece 8 has a
20 stopper 8a projecting outwardly from each of side pieces inclined in two directions, and contact of each stopper 8a with the rising piece 5b makes it possible to prevent the excessive downward movement of the massaging ball rollers. Then, the massaging ball rollers 3 are mounted respectively to the left and
25 right top ends of each massaging ball roller mount piece 8 for appropriately longitudinal movement. There are two massaging ball rollers 3 along the inside of each of the left and right edge portions 4b, 4b of the frame 4. The left and right

massaging ball rollers 3, 3 are connected together through a shaft 9 mounted across the massaging ball roller mount pieces 8, 8. Incidentally, it is to be understood that the massaging ball roller mount pieces 8 might be modified (not shown) and so on for installation of one or a plurality of massaging ball rollers 3 other than two, without being limited to two massaging ball rollers on each side.

The opposite ends of each roller chain 2 mounted in a ring-shape are fixed in a ring shape to the base portion 5a of each shaft bushing 5. Each roller chain 2 is mounted tensely in a ring shape round gears 12, 12 (corresponding to pulleys) mounted to shafts 10, 11 respectively mounted across the upper ends and the lower ends of the side edge portions 4b of the frame 4. Then, a drive motor 13 is mounted to the center of the lower end of the base portion 4a of the frame 4. The motor 13 provides slowing-down rotation to the shaft 11 through a bevel gear 14 mounted to a shaft 13a projecting downward from the drive motor 13 and a bevel gear 15 mounted to the shaft 11. With the rotation of the shaft 11, the gears 12 mounted to the left and right ends of the shaft 11 are rotated to move the roller chains 2 and the massaging ball rollers 3 vertically. Sensors 16 to vary the turning direction of the motor 13 are mounted to one side edge portion 4b in the vicinity of the upper and lower shafts 10, 11 of the side edge portions 4b of the frame 4, permitting the repetitive forward and backward movement of the massaging ball rollers 3. Projections 18 respectively having machine screw holes are also provided in the side edge portions 4b for mounting a cover 17 for protection of the roller chains 2.

The above roller drive device 1 according to the present invention is used as a unit incorporated constantly into the back of an appliance such as the seats of chairs, trains, planes and automobiles, for instance, or alternatively, may be applied as an
 5 independently available motor-driven roller massage instrument.

Figs. 7 to 9 show one embodiment of the motor-driven roller massage instrument incorporating the above roller drive device 1. Reference numeral 19 denotes a back base body, and
 10 the back base body 19 is formed of hard synthetic resin in a forwardly curved bucket-like shape of a size as approximately high as the back of the human body. The back base body has a widthwise central concave portion 20 extending from the upper end to the lower end of the back base body for installation of the
 15 roller drive device. The back base body also has outwardly-expanded left and right blade piece portions 21, 21 on the left and right sides of the back base body in the range of their intermediate portions to their lower ends. These left and right blade piece portions 21, 21 are thinner than the other portion to
 20 offer flexibility. Further, the roller drive device 1 is incorporated into the concave portion 20 for installation of the roller drive device.

The left and right blade piece portions 21, 21 of the back base body 19 have belts 19a for fastening the human body to the
 25 back base body 19 and belts 19b for fastening the back base body 19 to the seat of chair or automobile or like appliance.

In Figs. 8 and 9, a reference numeral 22 denotes a surface cover for covering the whole back base body 10 incorporating the

roller drive device 1. The surface cover 22 has left and right insertion slits for allowing the fastening belts 19a, 19b to pull out to the outside, and a fastener 23 is mounted to each of the left and right insertion slits. A longitudinal fastener 24 is also
5 provided in the widthwise center of the surface cover for allowing the easy detachment of the cover.

In use, the motor-driven roller massage instrument incorporating the roller drive device 1 according to the present invention as described above is fastened to the other appliance
10 with the fastening belts 19b (or allows to remain as it is when the other appliance is not in use). Then, the left and right blade piece portions 19, 19 are further curved to be fit to the user body, and in this state, the user body is fastened with the fastening belts. Thereafter, turning the switch of the drive
15 motor ON allows the roller drive device 1 to drive for gradually vertical movement of the roller chains 2. In cooperation with the vertical movement of the roller chains, the massaging ball rollers 3 make roller massaging actions by pressing against the user back ranging from the scruff of the neck to the waist in
20 sequence according to a guided curve along the guide slits 4c. Incidentally, the same may be said of the operation of the roller drive device 1 when incorporated as the unit into the other appliance.

Fig. 10 shows a frame of a motor-driven roller massage
25 instrument 25 according to another embodiment. The motor-driven roller massage instrument 25 has an outside frame 26 formed by bending a steel pipe into a shape approximately similar to the outside shape of the above back base body 19 so as

to surround the motor-driven roller massage instrument on all sides. Further, upper and lower lateral rods 26a, 26a made of band steel for supporting the upper and lower sides of a drive device are mounted across the left and right sides of the outside frame 26. The center of each of the upper and lower lateral rods 26a, 26a has a trapezoidal concave portion of a size as approximately wide as the roller drive device 1. Thus, the roller drive device 1 is mounted to the concave portions and is covered with the surface cover through a cushioning material such as a polyurethane foam material.

Fig.11 shows a frame of a legless chair 27 mounted with the motor-driven roller massage instrument. An outside frame 28a of a back portion 28 of the legless chair 27 is formed by bending a steel pipe so as to surround the back portion including no lower side corresponding to the lower side portion of the outside frame 26 of the motor-driven roller massage instrument 25. Similarly to the embodiment shown in Fig. 10, upper and lower lateral rods 28b, 28b are mounted across the left and right sides of the outside frame 28a, and the roller drive device 1 is mounted to a concave portion of each of the upper and lower lateral rods 28b. An outside frame 29a of a seat portion 29 is formed by bending a steel pipe in a rectangular frame shape, and rotatable connecting projections 29b are projecting from the opposite rear ends of the outside frame. The opposite lower ends of the outside frame 28a are fitted onto the connecting projections 29b, and the back portion 28 and the seat portion 29 are covered with a surface cover through a cushioning material such as a polyurethane foam material.

[Availability of Industrial Utilization]

According to the present invention, the roller chains are mounted in a ring shape round the upper and lower shafts in meshing with the gears mounted to the upper and lower shafts for vertical movement of the massaging ball rollers through the roller chains as described above. For that reason, there is no need for extra structures such as an empty box for receiving a taken-up belt, differently from "a double belt structure for forward and backward traveling" in the prior art. Further, since the roller chains may be moved in surely meshing with the gears mounted to the upper and lower shafts, there is no fear that the roller chains get out of place even though the roller chains are bent to some degree. Thus, there is no need for additional mechanisms for preventing the roller chains from getting out of place, differently from the prior art based on the rotation of an unbending stainless steel belt. Besides, the massaging ball rollers may be guided in accordance with the guide slits to offer various curves without the need for guide rails. As a result, it is possible to provide a simple, compact less-troubled structure.

The roller drive device according to the present invention has a size as high as the upper half of the human body, requires less volume and is lightweight. For that reason, the wider range of its application is expected by incorporating this roller drive device constantly as a unit into the seat of chair, automobile, train and plane or the like. Further, the above roller drive device may be applied to mount to the back of the seat of chair and automobile or the like simply as an individual

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CLAIMS

1. A unit-type roller drive device of a size as approximately high as the back of the human body for motor-driven roller massage actions, comprising:

5 a frame composed of a base portion and left and right edge portions standing upright from the left and right sides of the base portion;

a longitudinal guide slit provided in each of the left and right edge portions;

10 a shaft having a gear and mounted to each of the upper and lower ends of the frame;

a roller chain mounted in a ring shape round the upper and lower shafts in meshing with said gears; and

15 a shaft bushing mounted to each roller chain and fixed to massaging ball rollers, the left and right ends of said shaft bushings being mounted in an inserted state in said guide slits;

wherein the roller chains are moved vertically by rotation of the shafts with a drive motor, and in cooperation with the vertical movement of the roller chains, the massaging ball
20 rollers are guided in accordance with the guide slits for vertical movement.

2. A unit-type roller drive device for motor-driven roller massage actions according to claim 1, wherein each shaft
25 bushing has a plate-shaped base portion fixed to the opposite ends of each roller chain and a rising piece standing upright from the surface of the base portion and is structured that a pivotal massaging ball roller mount piece is mounted to the

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rising piece, the massaging ball rollers are mounted to the massaging ball roller mount piece, pins are provided to be projecting from the back of said base portion outwardly, and the guide rollers are mounted to said pins to insert the guide roller
5 portions into the guide slits.

3. A unit-type roller drive device for motor-driven roller massage actions according to claim 2, wherein the rising piece has a triangular shape, and the massaging ball roller mount
10 piece has a shape like the letter V and is structured that the massaging ball rollers are mounted to the respective top ends of two-directional side pieces of said massaging ball roller mount piece, and a stopper is provided to be projecting from the surface of each of said two side pieces.

15 4. A unit-type roller drive device for motor-driven roller massage actions according to claim 1, 2 or 3, wherein sensors to vary the turning direction of the drive motor is provided on one side edge portion of the frame in the vicinity of the upper and
20 lower shafts.

5. A motor-driven roller massage instrument, comprising:
a bucket-shaped base body having a concave portion provided in the center of the base body for installation of the
25 roller drive device and left and right flexible blade piece portions formed on the left and right sides of said concave portion; and

belts mounted to the left and right blade piece portions to

fasten the user body and also to fasten the other appliance;

wherein the roller drive device according to claim 1, 2, 3 or 4 is installed in said concave portion for installation of the roller drive device.

5

6. A motor-driven roller massage instrument, comprising:
an outside frame surrounding a bucket-shaped portion on all sides; and

10 upper and lower lateral rods mounted across the left and right frame portions of the outside frame and respectively having concave portions;

wherein the roller drive device according to claim 1, 2, 3 or 4 is installed in said concave portions.

15 7. A legless chair mounted with a motor-driven roller massage instrument, comprising:

a back portion rotatably mounted to a seat portion and having an outside frame surrounding the back portion on its upper, left and right sides;

20 upper and lower lateral rods mounted across the left and right sides of the outside frame and respectively having concave portions;

wherein the roller drive device according to claim 1, 2, 3 or 4 is installed in said concave portions.

ABSTRACT

It is an object to provide a more-simplified, compact unit-type roller drive device, which permits more certain, smooth driving for motor-driven roller massage actions, and also to a
5 motor-driven roller massage instrument mounted with such a unit type roller drive device.

There is provided a roller drive device of a size as approximately high as the back of the human body. The roller drive device has a frame composed of a base portion and left and
10 right edge portions standing upright from the left and right edges of the base portion, and a longitudinal guide slit is provided in each of the left and right edge portions. A shaft having a gear is mounted to each of the upper and lower ends of the frame, and a roller chain is mounted in a ring shape round
15 the upper and lower shafts in meshing with the gears. A shaft bushing fixed to massaging ball rollers is mounted to the roller chain, and the left and right ends of the shaft bushings are mounted in an inserted state in the guide slits. With the above structure, the roller chains are moved vertically by rotation of
20 the shafts with a drive motor. There is also provided a motor-driven roller massage instrument mounted with such a roller drive device.

FIG. 1

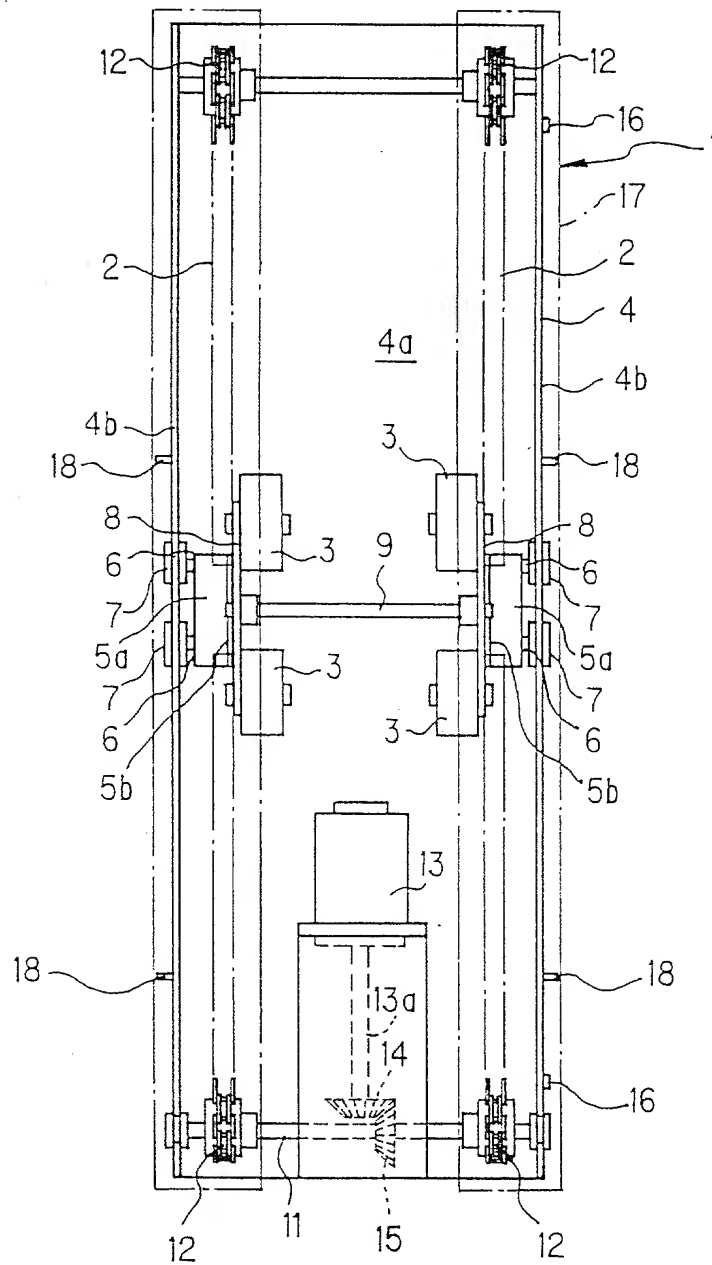


FIG. 2

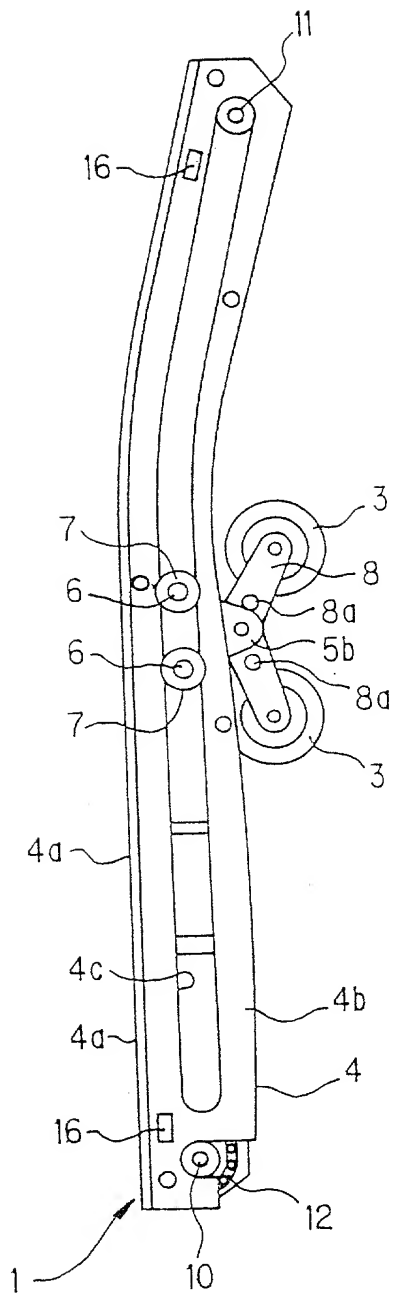
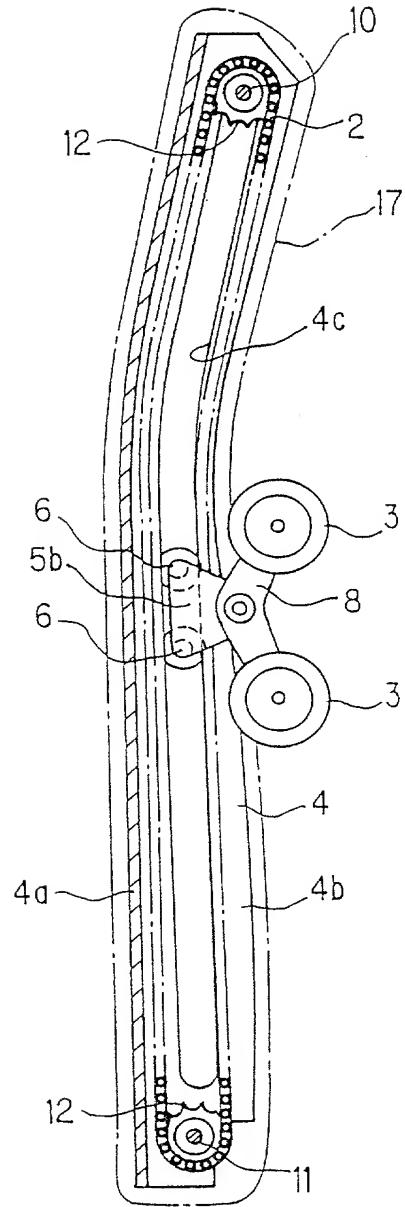


FIG. 3



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FIG. 4

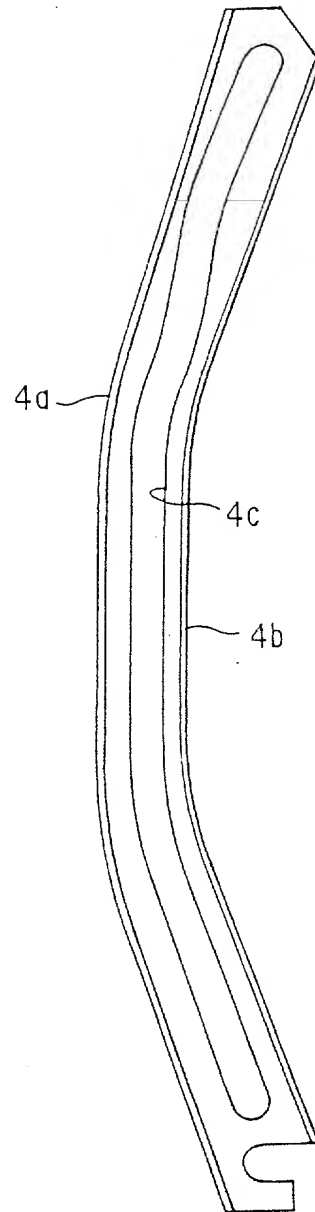


FIG. 5

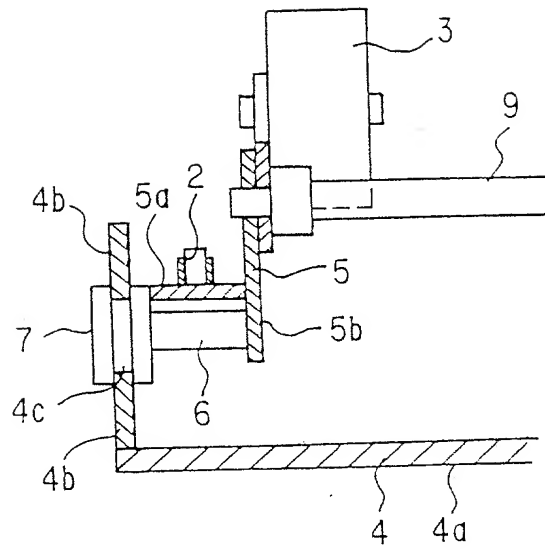


FIG. 6

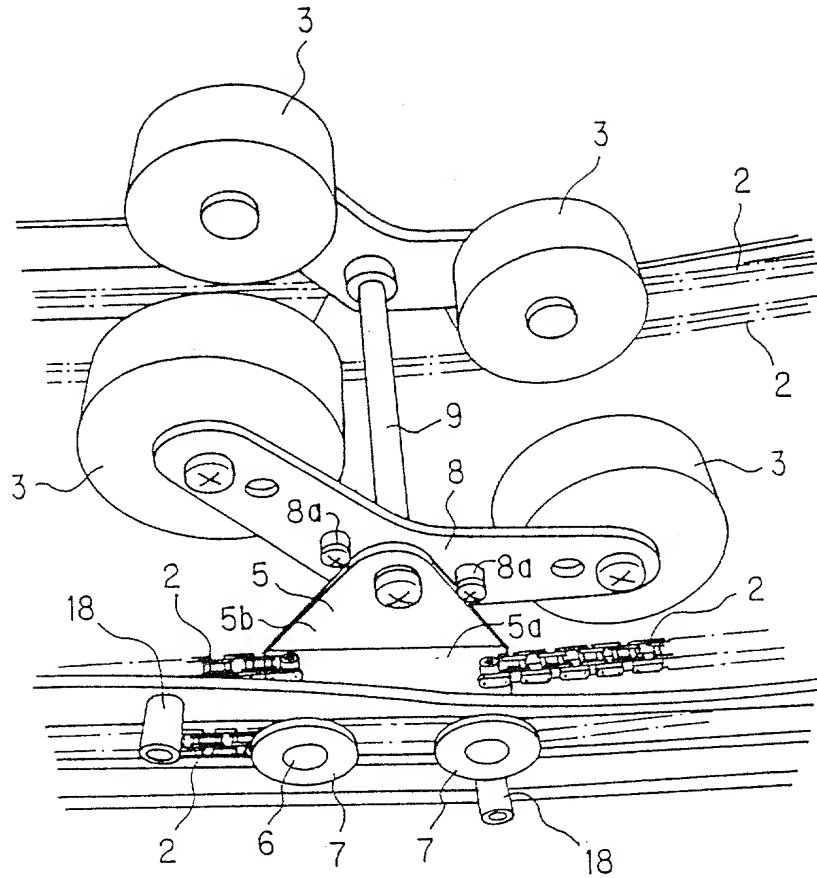


FIG. 7

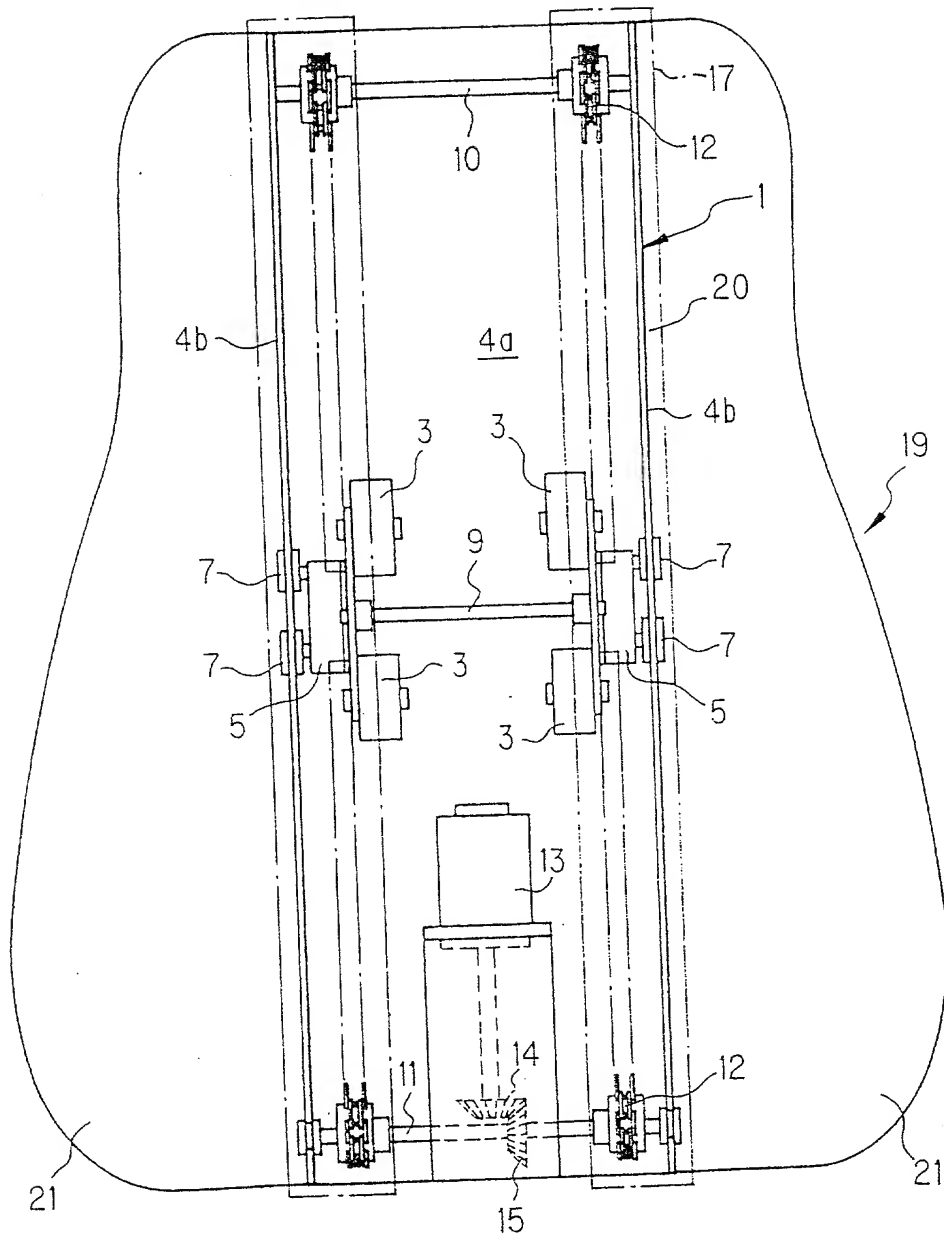


FIG. 8

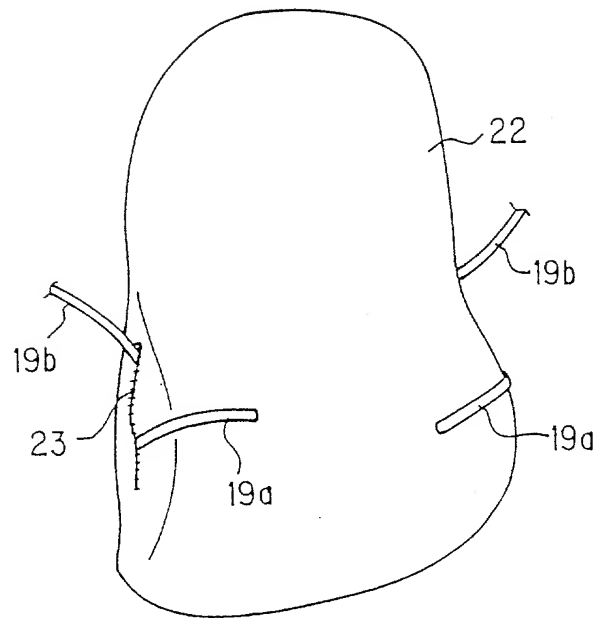


FIG. 9

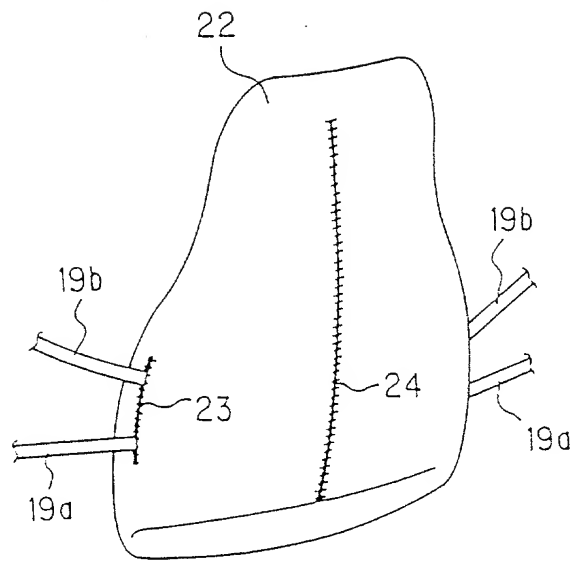


FIG. 10

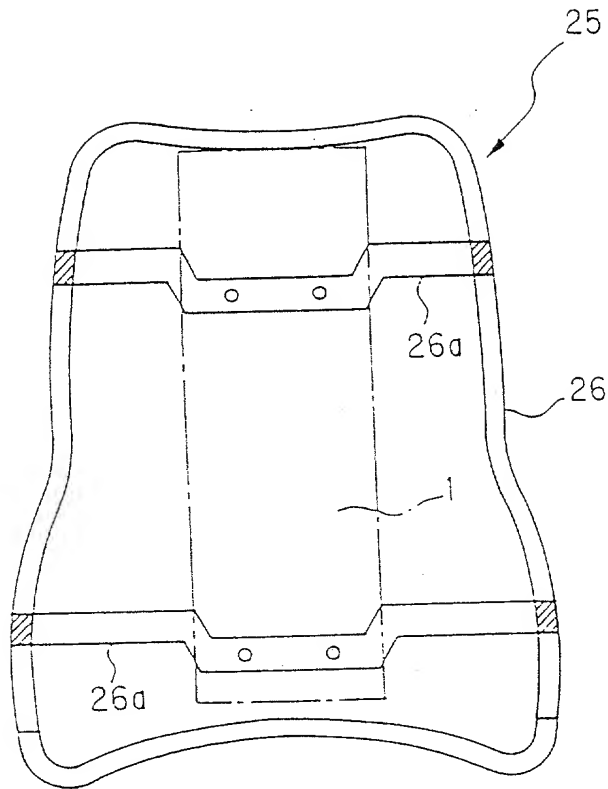


FIG. 11

